

Claims

- [c1] An apparatus for use with a fluid conduit and a fluid container, the apparatus comprising: a connector device comprising a connector body at least partially defining a first passage disposed at least partially within said connector body, wherein the first passage extends beyond the connector body, the connector device also defining a second passage disposed at least partially within the connector body and operable to allow fluid to flow from the fluid container to the fluid conduit.
- [c2] The apparatus of claim 1, wherein said connector device comprises a first connector adapted to connect to a discharge end of the fluid container and a second connector adapted to connect to the fluid conduit.
- [c3] The apparatus of claim 2, wherein said first passage extends beyond said first connector.
- [c4] The apparatus of claim 1, wherein said fluid container is a syringe.
- [c5] The apparatus of claim 4, wherein said syringe is a pre-filled syringe.

- [c6] The apparatus of claim 2, wherein said first connector and the discharge end of the fluid container form a luer connection.
- [c7] The apparatus of claim 1, wherein said fluid is saline.
- [c8] The apparatus of claim 1, wherein said fluid is contrast medium.
- [c9] The apparatus of claim 1, wherein said fluid is medication.
- [c10] The apparatus of claim 1, wherein said fluid is insulin.
- [c11] The apparatus of claim 1, wherein said first passage is at least partially defined by a bore.
- [c12] The apparatus of claim 1, wherein said second passage is at least partially defined by a bore.
- [c13] The apparatus of claim 1, wherein said first passage comprises a vent.
- [c14] The apparatus of claim 13, wherein said vent at least partially defines the first passage.
- [c15] The apparatus of claim 2, wherein said first connector defines screw threads adapted to interact with the discharge end of the fluid container.

- [c16] The apparatus of claim 2, wherein said first connector comprises a female connector.
- [c17] The apparatus of claim 16, wherein said female connector is formed of an upstanding wall member disposed outwardly from an opening of the second passage.
- [c18] The apparatus of claim 17, wherein the wall member comprises a substantially cylindrical wall surrounding the opening of the second passage.
- [c19] The apparatus of claim 1, wherein said connector body is substantially cylindrical.
- [c20] The apparatus of claim 13, wherein said vent is adapted to connect to said connector body.
- [c21] The apparatus of claim 1, wherein said fluid conduit is IV tubing.
- [c22] The apparatus of claim 1, wherein said connector body is operatively connected to an infusion pump.
- [c23] The apparatus of claim 1, wherein said fluid conduit is adapted to connect to an infusion pump.
- [c24] The apparatus of claim 13, wherein said vent extends within the discharge end of said fluid container.
- [c25] The apparatus of claim 24, wherein said fluid container

is a syringe.

- [c26] The apparatus of claim 25, wherein said syringe comprises a discharge injection section having a rearward portion.
- [c27] The apparatus of claim 26, wherein the rearward portion of said discharge injection section is of tapered conical construction.
- [c28] The apparatus of claim 27, wherein said discharge injection section comprises a forward connector portion formed with internal screw threads.
- [c29] The apparatus of claim 28, wherein said forward connector portion is substantially cylindrical.
- [c30] The apparatus of claim 29, wherein said discharge injection section comprises an injection nozzle.
- [c31] The apparatus of claim 30, wherein said vent extends beyond said injection nozzle and into said rearward portion of said discharge injection section.
- [c32] The apparatus of claim 1, wherein said connector body is comprised of at least two connected, substantially coaxial bodies.
- [c33] The apparatus of claim 1, wherein said first passage is

operable to allow gas flow from an external source to the fluid container.

[c34] The apparatus of claim 33, wherein said gas is air.

[c35] The apparatus of claim 33, wherein said external source is ambient.

[c36] A fluid delivery system comprising: a medical infusion device; a fluid conduit adapted to operably connect to said medical infusion device; a fluid container having a discharge end; and a connector device comprising a connector body, the connector device for connecting the fluid conduit to the fluid container, the connector body at least partially defining a first passage disposed at least partially within, and extending beyond, said connector body and into the discharge end of said fluid container.

[c37] The fluid delivery system of claim 36, wherein said first passage is operable to allow gas to flow into said fluid container without drawing fluid in said fluid container into the first passage.

[c38] The fluid delivery system of claim 36, wherein said connector body is operable to allow fluid flow from said fluid container to said fluid conduit.

- [c39] The fluid delivery system of claim 36, wherein said medical infusion device is an infusion pump.
- [c40] The fluid delivery system of claim 36, wherein said fluid conduit is IV tubing.
- [c41] The fluid delivery system of claim 40, wherein the IV tubing is capable of operatively connecting to the patient to allow fluid flow from the fluid conduit into the patient.
- [c42] The fluid delivery system of claim 36, wherein said fluid container is a syringe.
- [c43] The fluid delivery system of claim 42, wherein said syringe is a prefilled syringe.
- [c44] The fluid delivery system of claim 36, wherein said gas is air.
- [c45] The fluid delivery system of claim 36, wherein said fluid is saline.
- [c46] The fluid delivery system of claim 36, wherein said fluid is contrast medium.
- [c47] The fluid delivery system of claim 36, wherein said fluid is insulin.
- [c48] The fluid delivery system of claim 36, wherein said fluid is medicament.

- [c49] The fluid delivery system of claim 39, wherein said infusion pump is capable of operatively connecting to a patient.
- [c50] The fluid delivery system of claim 42, wherein said syringe comprises a discharge injection section having a rearward portion.
- [c51] The fluid delivery system of claim 50, wherein the rearward portion of said discharge injection section is of tapered conical construction.
- [c52] The fluid delivery system of claim 51, wherein said discharge injection section comprises a forward connector portion formed with internal screw threads.
- [c53] The fluid delivery system of claim 52, wherein said forward connector portion is substantially cylindrical.
- [c54] The fluid delivery system of claim 53, wherein said discharge injection section comprises an injection nozzle.
- [c55] The fluid delivery system of claim 54, wherein said first passage extends beyond said rearward portion of the discharge injection section.
- [c56] The fluid delivery system of claim 36, wherein said connector body is comprised of at least two connected, sub-

stantially coaxial bodies.

[c57] The fluid delivery system of claim 56, wherein the at least two connected, substantially coaxial bodies share a substantially vertical axis.

[c58] The fluid delivery system of claim 56, wherein the at least two connected, substantially coaxial bodies share a substantially horizontal axis.

[c59] The fluid delivery system of claim 36, wherein said connector body is substantially cylindrical.

[c60] The fluid delivery system of claim 36, wherein said first passage is defined by a bore.

[c61] A method of delivering fluid comprising: placing a connector device comprising a connector body in operative connection with a fluid conduit, the connector body at least partially defining a first passage and a second passage, wherein the first passage extends beyond the connector body; placing said fluid conduit in operative connection with a medical infusion device; connecting said connector device to a fluid container so that said fluid conduit is in fluid connection with said fluid container through the second passage, and the first passage extends within said fluid container to allow the flow of gas into the fluid container; placing said fluid conduit in op-

erative connection with a patient so that fluid may be delivered through said fluid conduit to said patient; and activating the medical infusion device to draw fluid from the fluid container for delivery to the patient.

- [c62] The method of claim 59, wherein the step of activating the medical infusion device allows air to pass through the first passage and into the fluid container.
- [c63] The method of claim 59, wherein the fluid container is a syringe.
- [c64] The method of claim 61, wherein the syringe is a pre-filled syringe.
- [c65] The method of claim 59, wherein the fluid conduit is IV tubing.
- [c66] The method of claim 59, wherein the medical infusion device is an infusion pump.
- [c67] The method of claim 59, wherein the step of connecting said connector to a fluid container creates a luer connection.
- [c68] The method of claim 61, wherein said syringe comprises a discharge injection section having a rearward portion.
- [c69] The method of claim 66, wherein the rearward portion of

said discharge injection section is of tapered conical construction.

[c70] The method of claim 67, wherein said discharge injection section comprises a forward connector portion formed with internal screw threads.

[c71] The method of claim 68, wherein said forward connector portion is substantially cylindrical.

[c72] The method of claim 69, wherein said discharge injection section comprises an injection nozzle.

[c73] The method of claim 70, wherein the step of connecting said connector to a fluid container allows said first passage to extend beyond said rearward portion of the discharge injection section.

[c74] The method of claim 59, wherein the gas is air.

[c75] The method of claim 59, wherein the fluid is saline.

[c76] The method of claim 59, wherein the fluid is contrast medium.

[c77] The method of claim 59, wherein the fluid is medication.

[c78] The method of claim 59, wherein the fluid is insulin.

- [c79] The method of claim 59, further comprising the step of deactivating the medical infusion device to stop drawing fluid from the fluid container.
- [c80] The method of claim 59, further comprising the step of disconnecting said connector from the fluid container.
- [c81] The method of claim 59, further comprising the step of replacing the fluid container with a second fluid container.
- [c82] The method of claim 59, further comprising the step of replacing the fluid conduit with a second fluid conduit.
- [c83] The method of claim 59, further comprising the step of removing the fluid conduit from operative connection with the medical infusion device.
- [c84] The method of claim 59, further comprising the step of removing the fluid conduit from operative connection with the patient.
- [c85] The method of claim 59, further comprising the step of removing the connector from operative connection with the fluid conduit.
- [c86] The method of claim 59, further comprising the step of replacing the medical infusion device with a second medical infusion device.

